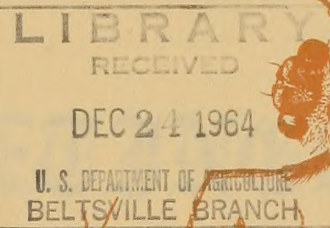


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December 18, 1964



Cooperative **ECONOMIC INSECT REPORT**

Issued by

**PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE**

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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COOPERATIVE ECONOMIC INSECT REPORT

SEASON'S GREETINGS

HIGHLIGHTS

WINTER GRAIN MITE heavy on oats in Ellis and Kaufman Counties, Texas. (p. 1293).

PINK BOLLWORM heavy at gins in southern Eddy County, New Mexico, and new infestations found in Pinal, Maricopa, Pima, Cochise and Graham Counties, Arizona. (p. 1294).

DETECTION

ZIMMERMAN PINE MOTH (*Dioryctria zimmermani*) reported for first time in Maryland. (p. 1294). IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) workers collected in Calhoun County, Georgia, constitute a new county record. (p. 1296).

FORECAST

ALFALFA WEEVIL egg mass counts high in Tennessee, indicating extremely heavy outbreak in spring of 1965. (p. 1293).

SPECIAL REPORTS

Status of the Screw-worm in the Southwest. (p. 1298).

Survey Methods for Corn Insects Damage in Southeastern United States. (pp. 1299-1302).

Reports in this issue are for week ending December 11, unless otherwise indicated.

WEATHER BUREAU'S 30-DAY OUTLOOK

MID-DECEMBER 1964 TO MID-JANUARY 1965

The Weather Bureau's 30-day outlook for mid-December to mid-January calls for temperatures to average below seasonal normals over most of the Nation except for near normal in the far Southwest and near to above normal in the Southeast. Coldest weather is expected in the Northern Plains.

Precipitation, frequently in the form of snow in the northern half of the Nation, is expected to exceed normal over most areas east of the Continental Divide. West of the Divide greater than normal precipitation is indicated for the central Pacific coast while subnormal totals should be confined to the Southern Plateau. Elsewhere, near normal amounts are in prospect.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price \$5.00 a year.

WEATHER OF THE WEEK ENDING DECEMBER 14

Temperatures averaged cooler than normal over the West and slightly above seasonal over the East. Some generous rains fell along the Texas coast and over the lower Mississippi River Valley.

TEMPERATURE: High pressure and clear skies predominated over the Great Basin and the Rocky Mountains. Temperatures cooled over the area dropping to 11° below zero at Ely, Nevada, on Sunday morning and to 20° to 30° below zero in some of the mountain valleys in Colorado. Temperatures at Albuquerque, New Mexico, averaged 8° below normal. The eastern half of the Nation warmed gradually during the week. Most of the East averaged 1° to 4° above seasonal. The principal exception was New England where temperatures 10° to 20° below normal continued to Friday morning. In spite of rapid warming, beginning on December 11, the weekly temperatures over most of New England averaged 3° to more than 6° below normal.

PRECIPITATION: Precipitation was mostly widespread and light. Only light precipitation fell from southern California to the northern Great Plains and parts of central Florida received no rain. Rains began along the lower Texas coast early in the week and spread northward and eastward. On Thursday, Houston, Texas, received 3.26 inches and Lake Charles, Louisiana, 4.50 inches. Stations along the Ohio River received over an inch on Friday. By Friday night, the rains had spread over 25 States from Michigan to Louisiana and eastward to the Atlantic Ocean. Fog accompanied the rains over much of the area. The fog held air traffic at a standstill at Chicago's O'Hare airport most of Saturday forenoon. The fog reduced the visibility in the New York City area to a few hundred feet most of the day on Sunday and severely hampered air traffic at many locations along the east coast. A cold front ended the foggy, cloudy, mild weather along the coast late Sunday night and early Monday morning and again clear skies and cool temperatures prevailed. (Summary supplied by U.S. Weather Bureau).

CEREAL AND FORAGE INSECTS

WINTER GRAIN MITE (Penthaleus major) - TEXAS - Infestations heavy on oats in Ellis County (Turney, Cole) and in Kaufman County (Turney).

PINK SCAVENGER CATERPILLAR (Sathrobrotia rileyi) - CALIFORNIA - Larvae heavy in sorghum in Holtville, Imperial County. (Cal. Coop. Rpt.).

GREENBUG (Schizaphis graminum) - OKLAHOMA - Counts ranged 5-10 per linear foot in wheat in Perkins area, Payne County. (Okla. Coop. Sur.). ARKANSAS - Surveys negative in Washington and Madison Counties, northwest. (Ark. Ins. Sur.).

LEAFHOPPERS - ALABAMA - Extremely large numbers occurring as usual in pasture sod and grass sods along highways in Tallapoosa and other central and southern counties. (Barwood et al.).

A DESERT TERMITE (Amitermes sp.) - TEXAS - Undetermined species reported in CEIR 14(44):1187 as locally heavy on oats in Madison County, determined as this genus by T. E. Snyder. (Meisch).

ALFALFA WEEVIL (Hypera postica) - TENNESSEE - Fall counts of egg masses on alfalfa range 25-50 per square foot; this is indicative of extremely heavy outbreak in spring of 1965. (Mullett).

PEA APHID (Acyrtosiphon pisum) - ARKANSAS - Numbers continue somewhat higher than normal for this time of year. Counts range 10-15 per square foot in vetch on University of Arkansas farm. (Ark. Ins. Sur.). NEW MEXICO - Populations continue light in alfalfa in Dona Ana County. (N.M. Coop. Rpt.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - NEW MEXICO - Infestations remain light in Dona Ana County alfalfa. (N.M. Coop. Rpt.). ARKANSAS - Surveys negative in Washington and Madison Counties, northwest. (Ark. Ins. Sur.).

BEE T ARMYWORM (Spodoptera exigua) - ARIZONA - Few scattered infestations persist in alfalfa; ranged light to medium in Pinal, Pima and Maricopa Counties. (Ariz. Coop. Sur.).

ALFALFA CATERPILLAR (Colias eurytheme) - ARKANSAS - Occasional larva collected December 9 in Washington County. This unexpected because of low temperatures in area. (Ark. Ins. Sur.).

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) - ARIZONA - Populations decreased to noneconomic levels in alfalfa in Maricopa and Pinal Counties. (Ariz. Coop. Sur.).

FRUIT INSECTS

TEXAS CITRUS MITE (Eutetranychus banksi) - FLORIDA - All stages scattered and moderate on leaves of orange at Lake Mary, Seminole County. (McLeod, Nov. 24).

A SNOW SCALE (Unaspis citri) - FLORIDA - Noted in several trees of grapefruit in grove at Ferndale, Lake County. (Felshaw, Nov. 30).

SAN JOSE SCALE (Aspidiotus perniciosus) - CALIFORNIA - Heavy on flowering plum nursery stock in San Jose, Santa Clara County. (Cal. Coop. Rpt.).

WHITE PEACH SCALE (Pseudaulacaspis pentagona) - FLORIDA - Noted on trunk of peach tree at Tampa, Hillsborough County. Wasp parasites present. (Fla. Coop. Sur., Dec. 1).

A LEAF-FOOTED BUG (Leptoglossus zonatus) - ARIZONA - Five infestations observed in backyard citrus in Phoenix, Maricopa County. (Ariz. Coop. Sur.).

TRUCK CROP INSECTS

CABBAGE LOOPER (Trichoplusia ni) - ARIZONA - Populations decreasing in most lettuce fields in Maricopa County. Few small, heavy populations continue to cause damage. (Ariz. Coop. Sur.). FLORIDA - Caused light damage to cabbage and celery examined in commercial planting at Sanford, Seminole County. (Desin).

BET ARMYWORM (Spodoptera exigua) - ARIZONA - Light infestations and light damage noted in lettuce fields of Maricopa County. (Ariz. Coop. Sur.).

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata undecimpunctata) - CALIFORNIA - Adults medium on lettuce in Reedley, Fresno County. (Cal. Coop. Rpt.).

COWPEA APHID (Aphis craccivora) - FLORIDA - Adults severe on cowpeas at Bartow, Polk County. (Snell, Nov. 23).

A LEAFHOPPER (Empoasca sp.) - FLORIDA - Nymphs severe on cowpeas at Bartow, Polk County. (Snell, Nov. 23).

A LEAF MINER FLY (Liriomyza sp.) - FLORIDA - Lightly damaged 100 percent of celery examined in commercial planting at Sanford, Seminole County. (Desin).

COTTON INSECTS

PINK BOLLWORM (Pectinophora gossypiella) - NEW MEXICO - Lint cleaner examinations show infestations to be quite heavy at gins in southern Eddy County; 695 larvae taken from 2,773 bales at Otis, 156 larvae from 2,911 bales at Loving, 219 larvae from 1,106 bales at Malaga, and 361 larvae from 2,364 bales at Carlsbad. Infestations indicated as lighter in northern Pecos Valley around Roswell, Chaves County. (N.M. Coop. Rpt.). ARIZONA - New infestations found in Pinal, Maricopa, Pima Cochise and Graham Counties. (Ariz. Coop. Sur.).

BOLL WEEVIL (Anthonomus grandis) - NEW MEXICO - All surveys and inspections to date have been negative. (N.M. Coop. Rpt.).

A WEEVIL (Anthonomus sp.) - ARIZONA - Infestations still being found in Yuma, Maricopa, Pinal and Pima Counties. Infestation found at Salome in northern Yuma County. (Ariz. Coop. Sur.).

A MEALYBUG (Spilococcus sp.) - CALIFORNIA - Populations medium on cotton plants locally in Calexico, Imperial County. (Cal. Coop. Rpt.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

ZIMMERMAN PINE MOTH (Dioryctria zimmermani) - MARYLAND - Larvae infested cones of loblolly pine (Pinus taeda) at Willards, Wicomico County, on July 31, 1964. Larvae collected by R. C. Moore and moths reared from these larvae determined by W. D. Duckworth. This is a new State record. (U. Md., Ent. Dept.).

MORNING-GLORY LEAF MINER (Bedellia somnulentella) - CALIFORNIA - Heavy population mining morning-glory foliage in El Centro, Imperial County. Ornamental morning-glories are used extensively in desert areas. (Cal. Coop. Rpt.).

AZALEA LEAF MINER (Gracilaria azaleella) - CALIFORNIA - Adults light on azaleas in Fresno, Fresno County; and heavy on azalea nursery stock in Saratoga, Santa Clara County. (Cal. Coop. Rpt.).

AN IO MOTH (Automeris io lilith) - FLORIDA - Larvae observed on leaves of azalea at Tampa, Hillsborough County. (Simmons, Dec. 1).

A SAP BEETLE (Conotelus mexicanus) - CALIFORNIA - Medium on rose bushes in Winterhaven, Imperial County. (Cal. Coop. Rpt.).

A PETIOLE GALL APHID (Pemphigus populicaulis) - NEW MEXICO - Some galls, probably caused by presence of this species, noted on freshly dug nursery stock in Dona Ana County. (N.M. Coop. Rpt.).

A ROYAL PALM BUG (Xylastodoris luteolus) - FLORIDA - Adults and nymphs noted on leaves of royal palm (Roystonea sp.) at Fort Myers, Lee County. (Kelley).

COCCIDS - MARYLAND - Aspidiotus perniciosus (San Jose scale) heavy on pyracantha in University Park, Prince Georges County. Crawlers of Pulvinaria sp. noted on same host at same locality. (U. Md., Ent. Dept.). FLORIDA - All stages of Cerococcus sp. light on Hibiscus sp. at Hialeah, Dade County. (Hickman, Dec. 4). CALIFORNIA - Asterolecanium arabis heavy on Pittosporum tobira nursery stock in Campbell, Santa Clara County. (Cal. Coop. Rpt.).

NATIVE HOLLY LEAF MINER (Phytomyza illicicola) - MARYLAND - Small larvae common in leaves of American holly at College Park, Prince Georges County. (U. Md., Ent. Dept.).

WILLOW BEAKED-GALL MIDGE (Phytophaga rigidae) - MARYLAND - Galls prominent on pussy willow at Temple Hills, Prince Georges County. (U. Md., Ent. Dept.).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE LICE - OKLAHOMA - Infestations of several species ranged light to moderate on cattle in Seminole (central) and Stephens (south central) Counties. (Okla. Coop. Sur.). UTAH - Controls applied to over 1,000 cattle in Garfield County and 2,000 cattle in Kane County; controls also applied to 1,800 head in San Juan County and approximately 30 percent of cattle in eastern Box Elder County treated. (Knowlton). Controls applied to 4,000 cattle in Uintah County and 2,000 cattle in Daggett County. (Knowlton, Bendixsen).

HOG LOUSE (Haematopinus suis) - OKLAHOMA - Infestations noted on hogs in Stephens County, south central. (Okla. Coop. Sur.).

A BROWN SPIDER (Loxosceles reclusa) - ARKANSAS - Single male collected in agriculture building on University of Arkansas campus at Fayetteville, Washington County. (Ark. Ins. Sur.).

BROWN DOG TICK (Rhipicephalus sanguineus) - MICHIGAN - Several specimens removed from dog recently in Oakland County. (Abel, Wells).

HOUSEHOLD AND STRUCTURAL INSECTS

BLACK CARPET BEETLE (Attagenus piceus) - MARYLAND - Larvae noted in home at College Park, Prince Georges County. (U. Md., Ent. Dept.).

COCKROACHES - OKLAHOMA - Infestations of unspecified species moderate in homes in Cleveland County, central area. (Okla. Coop. Sur.).

A BRACONID (Meteorus laeviventris) - CALIFORNIA - Adults medium in a residence in Redwood City, San Mateo County. (Cal. Coop. Rpt.).

MUSHROOM MITE (Tyrophagus putrescentiae) - CALIFORNIA - Heavy infestation in building and on ice cream machine in Santa Ana, Orange County. (A. Siber, Cal. Coop. Rpt.).

OLD-HOUSE BORER (Hylotrupes bajulus) - MARYLAND - Infesting structural wood in home at Pasadena, Anne Arundel County. (U. Md., Ent. Dept.).

WESTERN DRYWOOD TERMITE (Incisitermes minor) - CALIFORNIA - Medium infestation in paneling of house trailer in Gazelle, Siskiyou County. (Cal. Coop. Rpt.).

STORED-PRODUCT INSECTS

RED FLOUR BEETLE (Tribolium castaneum) - FLORIDA - Adults heavy on small grain and wheat at feed and grain mill at Okeechobee, Okeechobee County. (Strickland, Thomas, Dec. 1).

RICE WEEVIL (Sitophilus oryzae) - FLORIDA - Adults severe on wheat at Okeechobee, Okeechobee County. (Strickland, Thomas, Dec. 1).

CIGARETTE BEETLE (Lasioderma serricorne) - FLORIDA - Adults general on sacks of feed at Okeechobee, Okeechobee County. (Strickland, Thomas, Dec. 1).

AMERICAN COCKROACH (Periplaneta americana) - ALABAMA - Extremely heavy numbers reported in feed house where pet food stored in Lee County. (Barwood).

BENEFICIAL INSECTS

A PARASITIC WASP (Copidosoma truncatellum) - TEXAS - Infesting cabbage looper (Trichoplusia ni) from tomato greenhouse in Dallas County. (Meisch).

MISCELLANEOUS INSECTS

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - GEORGIA - Workers collected in city of Arlington, Calhoun County, on November 30. Det. by C. H. Lauffer. This is a new county record. (PPC).

PUMPKIN CATERPILLAR (Diaphania indica) - FLORIDA - Adults taken in Steiner traps at several locations in Pinellas County during period November 23 to December 1. (Fla. Coop. Sur.).

* BL = black/light; I = incandescent; MV = mercury vapor; O = other
 ** alf = alfalfa; beet = garden beet and/or sugar beet; cole = cole crops (crucifers); cott. = cotton; FC = field corn;
 grain = small grains; leg. = legumes (unspecified); lett. = lettuce; pean. = peanut; pepp. = pepper; pot. = potatoes;
 SC = sweet corn; sol. = solanaceous plants (unspecified); soy. = soybean; TC = truck crops (unspecified or mixed);
 tob. = tobacco; tom. = tomato.

STATUS OF THE SCREW-WORM (*Cochliomyia hominivorax*) IN THE SOUTHWEST

During the period December 6-12, only one screw-worm infestation was reported in the Southwestern Eradication Area and this from Atascosa County, TEXAS. No cases were reported from NEW MEXICO or ARIZONA. The Republic of Mexico reported 90 cases: Sonora 40, Veracruz 5, Chihuahua 15, Puebla 1, Coahuila 8, Tamaulipas 14, Durango 4, San Luis Potosi 1 and Nuevo Leon 2. Sterile screw-worm flies released: Texas 20,134,250, New Mexico 2,560,000, Arizona 5,720,000 and Mexico 51,328,800.

Year	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
	Current	Cumulative	Current	Cumulative	Current	Cumulative
1962	312	50,779	35	3,097	891.42	1,639.61
1963	20	6,339	78	7,300	25.64	86.83
1964	1	238	34	6,153	2.94	3.86

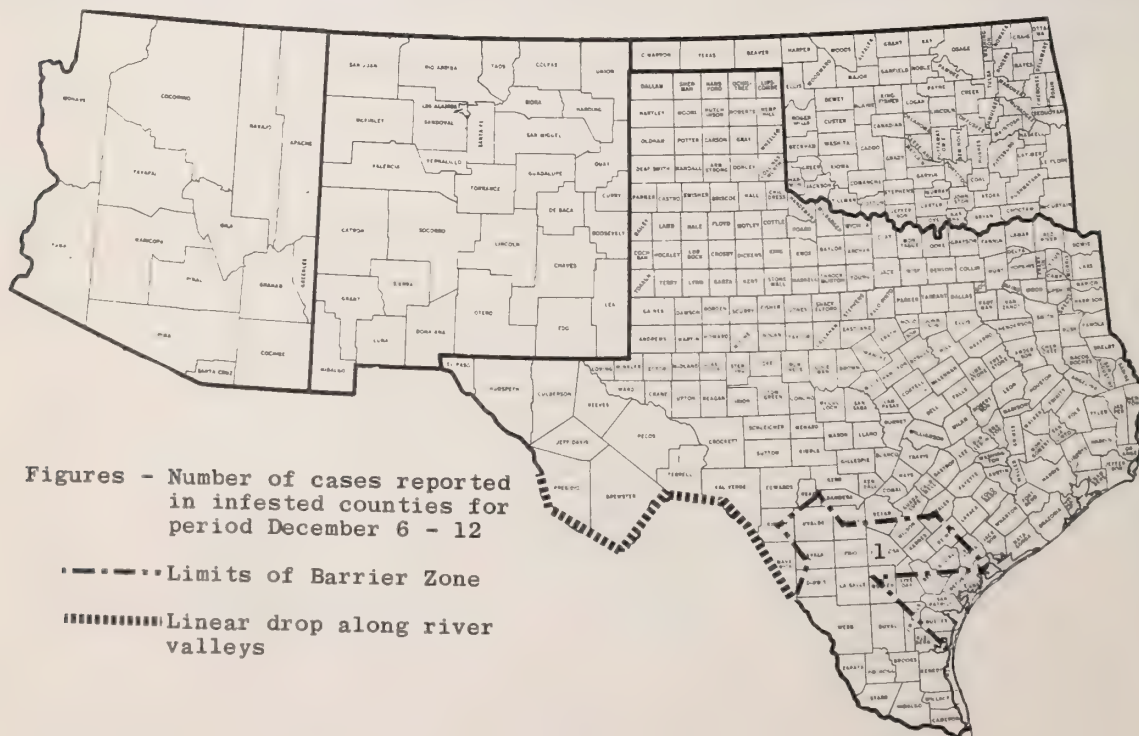
Table 1. Comparison of specimens reported during corresponding weeks in 1962 and 1963 in Southwestern Eradication Area.

Year	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
	Current	Cumulative	Current	Cumulative	Current	Cumulative
1963	67	5,930	24	1,411	279.16	420.26
1964	79	4,348	23	2,018	343.47	215.46

Table 2A. Mexican portion of Barrier Zone only.

Year	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
	Current	Cumulative	Current	Cumulative	Current	Cumulative
1963	52	2,057	9	236	577.77	871.61
1964	79	4,103	13	891	607.69	460.49

* Barrier Zone - Area in which screw-worm eradication operations are being carried out in an effort to prevent establishment of self-sustaining screw-worm population in the United States. (Anim. Dis. Erad. Div.).



Survey Methods for Corn Insects Damage in Southeastern United States

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Each year personnel from the Southern Grain Insects Research Laboratory conduct a survey of insect damage and abundance throughout the major corn-producing area of five Southeastern States. Data are obtained on the abundance, distribution, and damage caused by the corn earworm (Heliothis zea (Boddie)), and on the abundance and distribution of the rice weevil (Sitophilus oryzae (L.)), pink scavenger caterpillar (Sathrobrotia rileyi (Walsingham)), and the fall armyworm (Spodoptera frugiperda (J. E. Smith)). Distribution data are obtained on the European corn borer (Ostrinia nubilalis (Hübner)), and the southwestern corn borer (Zeadiatraea grandiosella (Dyar)). Records are made of agronomic factors which might directly or indirectly influence insect abundance, e.g., row width, plants per acre, number of ears per plant, kernel color, interplanting with other crops, weed conditions, disease, drought, etc. The survey is useful in providing this Laboratory with information regarding the general status of the insects for which the Laboratory is responsible. In addition, it also provides a continuous record of changing cultural conditions which influence insect abundance.

On the average, one field is examined for every 700,000 bushels of corn produced during the 5 years immediately prior to the survey in each crop district. Production data are obtained from the Federal-State Crop Reporting Service, Statistical Reporting Service, USDA, which has headquarters in each State.

Specific cornfields within a district are determined prior to the start of the survey by placing dots, each representing a field, along the main highways on a road map. A commercial map obtained from oil companies is preferred to the official State Highway Department map from each State because it is usually more detailed and, therefore, useful in estimating mileage between fields or distance of fields from towns. Dots, representing cornfields, are placed along main highways. Considerable time is saved by limiting travel to main highways rather than including the secondary highways. Occasionally during the course of a survey, no cornfield is found in the vicinity of the dot on the map. In this situation, travel is continued in the same direction and the first cornfield encountered is surveyed. The only exception to this rule is made when such a field occurs in another crop-reporting district. In this situation the course of travel is reversed.

The survey is usually begun during the last week in August in south Georgia and north Florida and ends during the last week in September in North Carolina. All work is done by two-man teams, one man to record the data and one to make the observations.

Each field is entered near the center of the most accessible side, usually the side near the road. The first sampling site is located by walking into the field 25 paces from the margin. Observations are made on the top ears of 10 consecutive plants beginning with the first plant on the right in front of the observer, depending on the direction of the row. After a general examination of the field, the husks are pulled back from each ear of corn to be observed and the following information is recorded: (1) Date; (2) location of field in State; (3) row width; (4) number of plants per acre; (5) number of ears per plant; (6) kernel color; (7) earworm damage class; (8) number of ears infested with rice weevil, pink scavenger caterpillar, and fall armyworm; (9) plants infested with European corn borer and southwestern corn borer; and (10) notes on miscellaneous items such as cultural practices, weeds, etc.

After observations on the last plant at the first sampling site are recorded, the second sampling site is selected by walking 20 paces toward the center of the field from the first site. Data are again obtained on items 7 through 10 above. The same procedure is repeated for subsequent sampling sites until 50 ears (10 ears each from 5 sampling sites) are examined in each field.

After the field is surveyed, the dot on the map is crossed off. The field number recorded on the survey-data-sheet is also recorded on the map beside the dot. Maps are filed for future reference.

For the fall armyworm, only those ears in which the fall armyworm larvae are actually present are counted as infested. This procedure probably results in a lower estimate of fall armyworm infestation than actually occurs in addition to increasing the estimate of corn earworm damage.

The following table of damage classes was first determined by R. A. Blanchard, formerly of the Entomology Research Division, ARS, USDA, a few years ago after he had graded several thousand ears of corn damaged by the corn earworm:

Class	0	1	2	3	4	5
Penetration (in.)	0	To 0.4	0.4 to 1.0	To 2	To 3	Over 3
Percent loss	0	0.44	1.87	4.10	7.87	16.55

A number of hybrids and open-pollinated lines were included in the study. Mr. Blanchard and the authors are aware that the true percentage of loss, when measured on a depth of penetration basis, depends on the size of the ear; however, they believe that the system is the best approximation of true damage when limitations must be placed on time, personnel, and funds. All measurements of actual earworm penetration are made beginning with the first kernels of the ear, not with the tip of the ear.

Until 1963, the form shown in Figure 1 was used to record data from the survey. In 1963, data were recorded on IBM cards in the field by means of the IBM Port-A-Punch. Figure 2 shows an IBM card on which the same data in Rep. 1 Figure 1 have been entered. The headings are used only to illustrate the various columns used to record the different data. The date and any observational data were written on the back of the card.

Table 1 illustrates the summary of the results of the 1962 survey in Georgia, whereas table 2 is a summary of the estimated loss of corn due to earworm damage in five Southeastern States in 1962.

Tables and figures on the following two pages.

District
Georgia Field No.

Field G-V-13 No ears & kernel color 2Y Date 9-17-62

Width, 120" 160" Average 30" 40" Plants per 87'1" 65'5" of double row <u>82</u>
4 rows 128" 168" row width 32" 42" 81'7" 62'2"
136" 176" 34" 44" 77'0" 59'4"
144" 184" 36" 46" 72'7" 56'11"
<u>152" 192"</u> <u>38" 48"</u> <u>68'8"</u> 54'5"

Rep.	CEW Damage Class						PSC	RW	FAW	Remarks (Lodging, AGM, etc.)
	0	1	2	3	4	5				
I	/			/	/	/			/	Slight amount of lodging
II								/		possibly distorted injury
III	/	/		/	/			/	/	
IV								/		1 plant with European corn borer
V	/	/		/	/					
Total	5	12	24	5	3	1	38	12	2	

1. Multiply each class total by percent loss for the class
2. Divide cumulative total percent loss by 50
3. $(12)(0.44) + \text{-----} + (1)(16.55) = 2.2\% \text{ loss}$
50

1. $\frac{38}{50} \times 100 = 76\%$ of plants infested with PSC
2. $\frac{12}{50} \times 100 = 24\%$ of plants infested with RW
3. $\frac{2}{50} \times 100 = 4\%$ of plants infested with FAW

Figure 1 - Example of completed field data sheet used in corn insects damage survey until 1963.

State	District	Field No.	Row width	Plants per 0.01 acre	Ears & color	Corn earworm damage class by ear	Pink scavenger caterpillar and rice weevil by ear	Fall armyworm and European corn borer by ear
0	0	0	0	0	0	0	0	0
2	4	6	8	10	12	14	16	18
1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9

Figure 2 - Example of IBM card field punched to record corn insects survey damage and abundance data. Card was punched to show same data in figure although the punch-card system was not used until 1963.

Table 1 - Extent and degree of infestation by corn insect pests recorded during the 1962 survey in Georgia.

District	:	:	:Percent of fields infested:				:Percent of plants infested:				:Percent: Number
	:	:	:	:	:	:	:	:	:	:loss of:of fields	
	:Number:	:	:	:Pink	:	:	:	:Pink	:	:grain :	with
	:fields:	Corn:	:	:scaven-	:Fall	:Corn:	:	:scaven-	:Fall	:due to :	European
	:exam-ear-: Rice	:	:ger cat-:army-ear-: Rice	:	:ger cat-:army-earworm:corn borer						
	ined	:worm:weevil:erpillar:worm	:	:worm:weevil:erpillar:worm	:	:worm:weevil:erpillar:worm	:	:damage :	larvae		
IV	4	100	57.1	100	42.8	78.1	4.5	31.8	1.7	1.2	0
V	14	100	57.1	92.8	7.1	66.2	5.7	55.6	.5	.7	1
VI	15	100	86.6	100	.0	88.2	17.6	69.0	.0	1.5	0
VII	25	100	100	100	4.0	61.1	29.1	77.9	.1	.4	0
VIII	27	100	100	100	14.8	76.1	18.4	83.7	.3	1.3	0
IX	9	100	100	100	.0	78.6	53.1	80.4	.0	1.1	0
State Average	-	100	88.6	98.9	9.2	72.9	21.4	72.1	.3	1.0	-

Table 2 - Production, percent damage, and estimated loss (bushels) of the corn crop due to corn earworm damage (1962 survey areas).

State	Average yearly production 1957-1961	Loss due to corn earworm (percent)	Total loss due to earworm (bu.)
Georgia	60,696,800	1.0	606,968
Florida	7,913,600 ^{a/}	1.1	87,050
Alabama	48,599,400	1.7	826,190
South Carolina	21,959,400	1.4	307,432
North Carolina	71,386,400	1.5	1,070,796
Total	210,555,600		2,898,436
Average	--	1.3	--

^{a/} Average production 1956-1960.

UNITED STATES DEPARTMENT OF AGRICULTURE
Hyattsville, Maryland 20781

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